Amendments to the Specification

Please amend the paragraph beginning on page 1, line 19, as follows:

A nitride semiconductor is one of desirable candidate direct-band-gap semiconductor materials, however, it is difficult to produce a bulk of its single crystal. Therefore, hetero-epitaxial technology is usually employed to grow GaN on a different material substrate such as sapphire, SiC, etc. by metal-organic chemical vapor deposition (MOCVD) for the present. It was shown that sapphire is a preferable substrate for growing a high efficient light-emitting device of nitride semiconductor ~~cause~~ <u>because</u> of its stability at high temperature under atmosphere with ammonia in an epitaxial vapor deposition process compared with the other different material ~~substrate~~ <u>substrates</u>. When a sapphire substrate is employed, a process for forming AlGaN layer as a buffer layer on the sapphire substrate at low-temperature around 600°C is usually employed to grow nitride semiconductor layers thereon. It can improve crystallinity of the nitride semiconductor layers.

Please amend the paragraph beginning on page 2, line 6, as follows:

~~Concretely~~ <u>Specifically</u>, a nitride semiconductor element grown on a sapphire substrate is used for a blue LED, a pure-green LED with higher luminance than conventional LEDs, and an LD(laser diode). They are applied for a full-color display; traffic lights; an image scanner; light sources such as a light source for an optical disc, which is media, for example DVD, capable of memorizing a large-capacity of information; a light source for communication; a printer; etc. Further, it is anticipated to apply to an electronic device such as a field-effect transistor (FET).

Please amend the paragraph beginning on page 35, line 21, as follows:

BRIEF DESCRIPTION OF THE DRAWINGS

~~Fig. 1~~ Figs. 1A-1C schematically ~~shows a~~ show cross-sectional ~~view~~ views of a process of producing of the invention.

~~Fig. 2~~ Figs. 2A-2C schematically ~~shows a~~ show cross-sectional ~~view~~ views of a process of producing of the invention.

~~Fig. 3~~ Figs. 3A-3F schematically ~~shows a~~ show cross-sectional ~~view~~ views of an embodiment of the invention.

~~Fig. 4~~ Figs. 4A-4C schematically ~~shows a~~ show cross-sectional ~~view~~ views of another embodiment of the invention.

Fig. 5 schematically shows a cross-sectional view of another embodiment of the invention.

Fig. 6 schematically shows a plan view of another embodiment of the invention.

Fig. 7 schematically shows a plan view of another embodiment of the invention.

Fig. 8 schematically shows a plan view of another embodiment of the invention.

Fig. 9 schematically shows a plan view of another embodiment of the invention.

Fig. 10 schematically shows a plan view of another embodiment of the invention.

~~Fig. 11~~ Figs. 11A-11B schematically ~~shows a~~ show cross-sectional ~~view~~ views and a plan view of another embodiment of the invention.

~~Fig. 12~~ Figs. 12A-12F schematically ~~shows a~~ show cross-sectional ~~view~~ views and a plan view of another embodiment of the invention.

~~Fig. 13~~ Figs. 13A-13F schematically ~~shows a~~ show cross-sectional ~~view~~ views of another process of producing of the invention.

~~Fig. 14~~Figs. 14A-14D schematically ~~shows a~~ show cross-sectional ~~view~~ views of another process of producing of the invention.

~~Fig. 15~~ Figs. 15A-15B schematically ~~shows a~~ show cross-sectional ~~view~~ views of another embodiment of the invention.

Fig. 16 schematically shows a plan view of another embodiment of the invention.

Fig. 17 schematically shows a plan view of another embodiment of the invention.

Fig. 18 is a graph showing current-output characteristics of an embodiment of the invention and a comparative example.

~~Fig. 19 shows an oblique~~ Figs. 19A-19C show a perspective view, a plan view, and a schematic cross-sectional diagram of the light-emitting device according to one embodiment of the invention.

~~Fig. 20 shows an oblique~~ Figs. 20A-20C show a perspective view, a plan view, and a schematic cross-sectional diagram of the light-emitting device according to another embodiment of the invention.

Please amend the paragraph beginning on page 38, line 2, as follows:

The following description will describe a process of producing ~~of~~ an embodiment of the nitride semiconductor element according to the invention with reference to the drawings.

Please amend the paragraph beginning on page 38, line 5, as follows:

The nitride semiconductor 2 including at least a second conductive type nitride semiconductor layer, a light-emitting layer, a first conductive type nitride semiconductor layer is grown on a different material substrate 1 such as sapphire (Fig. 1A). Subsequently, a first terminal 3 (p-type terminal, for example) is formed on the nitride semiconductor layers. Next, a first insulating protect layer 4 is formed on an opening portion, or an exposed portion of the nitride semiconductor (Fig. 1B). Further, a conductive layer 5 for alloying at attachment is formed (Fig. 1C). It is preferable that the conductive layer has a three-layer structure composed of an intimate-contact, a barrier layer, and a eutectic layer. On the other hand, a supporting substrate 11 is prepared. It is preferable that a conductive layer 12 is also formed on the surface of the supporting substrate (Fig. 2A). Subsequently, the nitride semiconductor element and the

supporting substrate are attached by ~~thermocomression~~ thermocompression bonding (Fig. 2B). Each of attached surfaces is alloyed as a conductive layer 13 after attaching. Then, the different material substrate is eliminated (Fig. 2C). After the different material substrate is eliminated, the nitride semiconductor layer is broken into chips, and a second terminal is formed on an exposed portion of the second conductive type nitride semiconductor layer (Fig.3A). It should be appreciated that asperity may be formed on the exposed portion of the second conductive type nitride semiconductor layer except the portion ~~formed~~ forming the second terminal (Fig. 4). Subsequently, a second insulating protect layer covers the top surface of the nitride semiconductor element except a region for wire-bonding (Fig.3B, Fig. 4B), and the nitride semiconductor element is obtained by dicing into chip. In addition, it should be appreciated that the second insulating protect layer may be formed in an asperity shape (Fig. 5, Fig. 11).

Please amend the paragraph beginning on page 39, line 5, as follows:

It is adequate that the different material substrate 1 is a substrate capable of epitaxial growth for the nitride semiconductor 2, and the size or thickness of the different material substrate is not restricted especially. An insulating substrate such as sapphire with any one of C-facet, R-facet, or A-facet as a principal surface, or spinel (MgA12O4); silicon carbide (6H, 4H, 3C); silicon; ZnS; ZnO; Si; GaAs; diamond; and an oxide substrate such as lithium niobate, gallium acid neodymium, which are capable of lattice junction with nitride semiconductor, can be employed as the different material substrate. In addition, when having enough thickness (several ~~tensim~~ tens of μm) capable of device processing, a nitride semiconductor substrate such as GaN or AlN can be employed. The different material substrate with off angle can be employed. It is preferable that the angle is 0.1-0.5 degrees, and is more preferable that the angle is 0.05-0.2 degrees, when sapphire with C-facet is employed.

Please amend the paragraph beginning on page 40, line 7, as follows:

An LED element of nitride semiconductor will be described in detail as follows. After the buffer layer is grown at low temperature on the different material substrate, the second conductive type nitride semiconductor layer described ~~bellow~~ below is formed. It is preferable that a high-temperature-grown layer, which is grown at high temperature, is formed on the buffer layer. Undoped GaN or GaN doped with n-type impurity can be employed as the high-temperature-grown layer. It is preferable to employ the undoped GaN for growing in high crystallinity. It is preferable that the thickness of the high-temperature-grown layer is more than or equal to 1 μm. It is more preferable that it is 3 μm. It is preferable that the growing temperature of the high-temperature-grown layer is 900-1100°C. It is more preferable that it is more than or equal to 1050°C.

Please amend the paragraph beginning on page 41, line 14, as follows:

Including Al in the well layer can provide short wavelength, which is a difficult wavelength range to be obtained by the conventional well layer of InGaN and is around 365 nm of wavelength corresponding to the band gap of GaN ~~concretely~~ specifically.

Please amend the paragraph beginning on page 41, line 18, as follows:

It is preferable that the thickness of the well layer is more than or equal to 1 nm and not more than 30nm. It is more preferable that it is more than or equal to 2 nm and not more than 20nm. It is further more preferable that it is more than or equal to 3.5 nm and not more than 20nm. Because the well layer may not have the effect appropriately, when it is less than 1 nm. Further, when it is more than 30 nm, the crystallinity of quaternary of InAlGaN may be reduced, so that the characteristics of the element may be reduced. In addition, when it is more than or equal to 2 nm, it can provide the layer with less unequal thickness and with relative uniform layer-quality.

Additionally, when it is not more than 20 nm, it can grow the crystal ~~with~~ while reducing the occurrence of crystal fault. In addition, when the thickness is more than or equal to 3.5 nm, it can improve the output. Because the thickness of the well layer is increased, light-emitting recombination is performed in high light-emission efficiency and in high internal quantum efficiency against numbers of carriers as an LD driven by a larger amount of current. The effect can be achieved especially in a multi-quantum-well structure. When its thickness is more than or equal to 5 nm in a single quantum layer, the effect can be achieved for improving output as mentioned above. However the number of the well layers is not restricted, when it is more than or equal to 4, it is preferable that the thickness of the well layers is not more than 10 nm so as to reduce the thickness of the active layer. Because when the thickness of each layer composing the active layer is thick, the total thickness of the active layer should be thick, so that it is prone to increase Vf. It is preferable that the multi-quantum-well structure has at least one well layer, whose thickness is in the above range, or not more than 10nm. It is more preferable that the thickness of all the ~~all~~ well layers is not more than 10 nm, as mentioned above.

Please amend the paragraph beginning on page 42, line 18, as follows:

Further, it is preferable that the barrier layer is doped with p-type impurity or n-type impurity, or ~~undpoed~~ undoped, and is more preferable that it is doped with n-type impurity or undoped, similar to the well layer. For example, when n-type impurity is doped in the barrier layer, it is required that its concentration is at least more than or equal to $5x10^{16}/cm^3$. It is preferable that it is more than or equal to $5x10^{16}/cm^3$ and not more than $2x10^{18}/cm^3$ in an LED, for example. In addition, it is preferable that it is more than or equal to $5x10^{17}/cm^3$ and not more than $1x10^{20}/cm^3$, and it is more preferable that it is more than or equal to $1x10^{18}/cm^3$ and not more than $5x10^{19}/cm^3$ in a high-power LED, or LD. In this case, it is preferable that the well layer does not include n-type impurity substantially, or is grown ~~with~~ while undoped. In addition, when n-type impurity is doped in the barrier

layer, all barrier layers in the active layer can be doped, or a part of them can be doped the rest of them can be undoped. Here, when a part of the barrier layers are doped with n-type impurity, it is preferable that the barrier layers in the n-type layer side in the active layer is doped. For example, doping into the n-th barrier layer Bn (n is a positive ~~integer.~~ integer) from the n-type layer side can inject electrons into the active layers effectively. So that it can provide the light-emitting element with high light-emission efficiency and high internal quantum efficiency. Regarding ~~to~~ the well layers, doping into the m-th well layer Wm (m is a positive ~~integer.~~ integer) from n-type layer side can also provide the effect similar to the barrier layers. Additionally, doping both the barrier layer and the well layer can provide the similar effect.

Please amend the paragraph beginning on page 53, line 21, as follows:

Another structure of the nitride semiconductor element obtained by the embodiment 1 will be described as follows. Fig. 6 shows a type forming the second terminals at the corners in the diagonal line. It is adequate that the first terminal is not formed on the region overlapping the second terminal, and its size and its shape are not restricted especially. In addition, the second terminals can be formed not only at two corners but also at all of the four corners. Fig. 7 shows a type in which second terminals ~~extending~~ extend to the middle. Fig. 8 shows a type in which the first terminal has pad terminals. Fig. 9 shows a type in which the first terminal with a L-shape covers the second terminal whereby the first terminal is formed in wide region. Furthermore, Fig. 10 shows a type having the second terminal in the center portion. The first terminal is formed in a periphery of the second terminal so as not to overlap it.

Please amend the paragraph beginning on page 53, line 22, as follows:

~~EMBODIEMENT 3~~ EMBODIMENT 3